

EXHIBIT N



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United States Patent [19]
Bernardi et al.

[11] **Patent Number:** **6,021,278**
[45] **Date of Patent:** **Feb. 1, 2000**

[54] **SPEECH RECOGNITION CAMERA UTILIZING A FLIPPABLE GRAPHICS DISPLAY**

4,837,817	6/1989	Maemori	348/211
4,951,079	8/1990	Hoshino et al.	396/56
5,557,358	9/1996	Mukai et al.	396/374 X
5,664,243	9/1997	Okada et al.	396/374 X
5,749,000	5/1998	Narisawa	396/147 X
5,774,754	6/1998	Ootsuka	396/374 X

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[73] Assignee: **Eastman Kodak Company**, Rochester,
N.Y.

[21] Appl. No.: **09/126,147**

[22] Filed: **Jul. 30, 1998**

[51] Int. Cl.⁷ **G03B 13/02; G03B 17/00**

[52] U.S. Cl. **396/57; 396/374**

[58] Field of Search 396/56-59, 297,
396/374, 88, 147, 287, 296, 281; 348/211,
333

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,389,109	6/1983	Taniguchi et al.	396/56
4,757,388	7/1988	Someya et al.	348/333

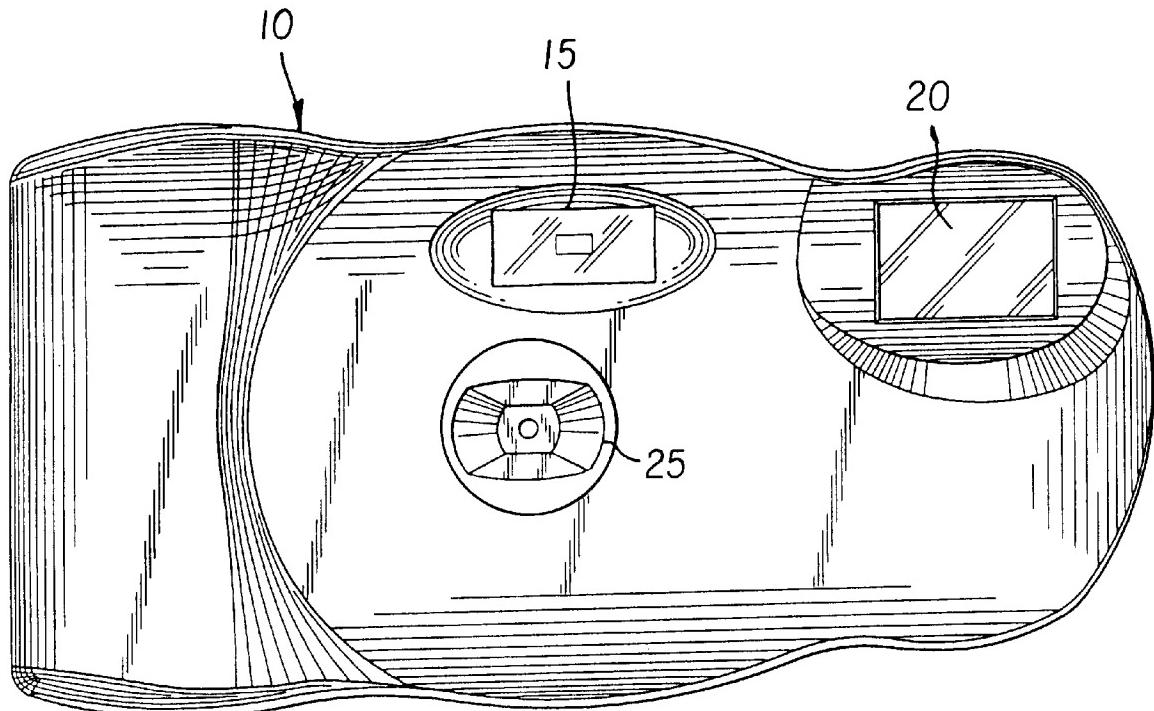
Primary Examiner—W. B. Perkey

Attorney, Agent, or Firm—Peyton C. Watkins

[57] **ABSTRACT**

A camera for recognizing voice commands, and for visually displaying an image to be captured by the camera with camera operations performed thereon as instructed by the voice commands, the camera comprises a camera body; a microphone disposed on the camera body for inputting voice commands; a controller disposed in the camera body for receiving and recognizing voice commands, and for implementing results of the voice command; and a display attached to the camera body for visually displaying the image to-be-captured by the camera with the camera operations performed thereon as instructed by the voice commands.

10 Claims, 9 Drawing Sheets



**Exhibit
PX 0012**

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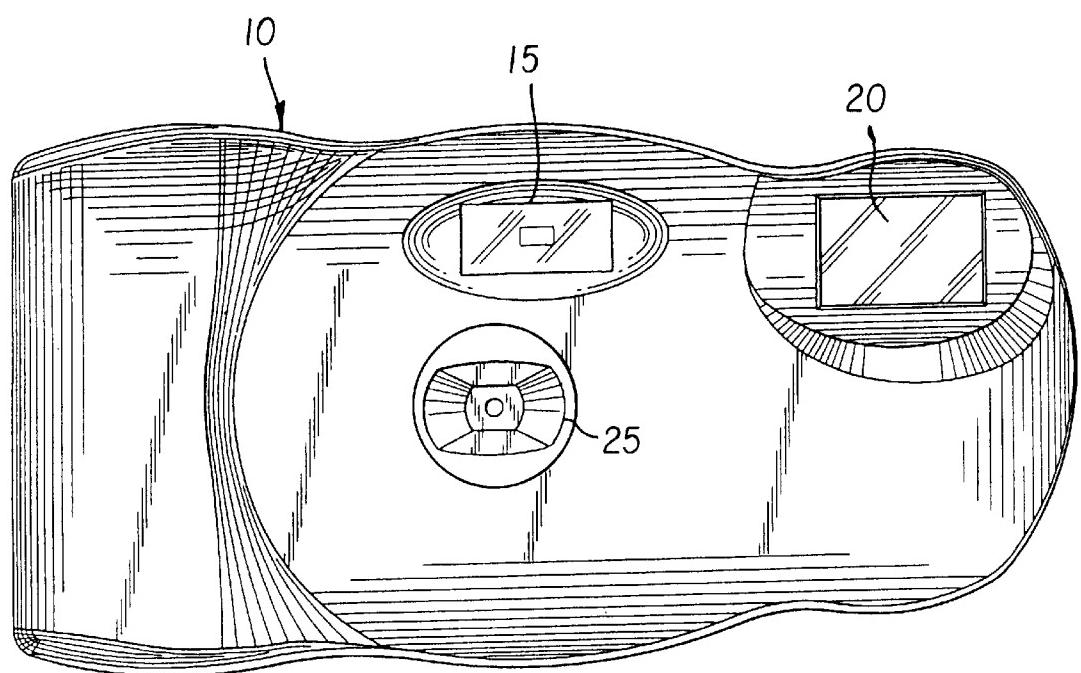


FIG. 1

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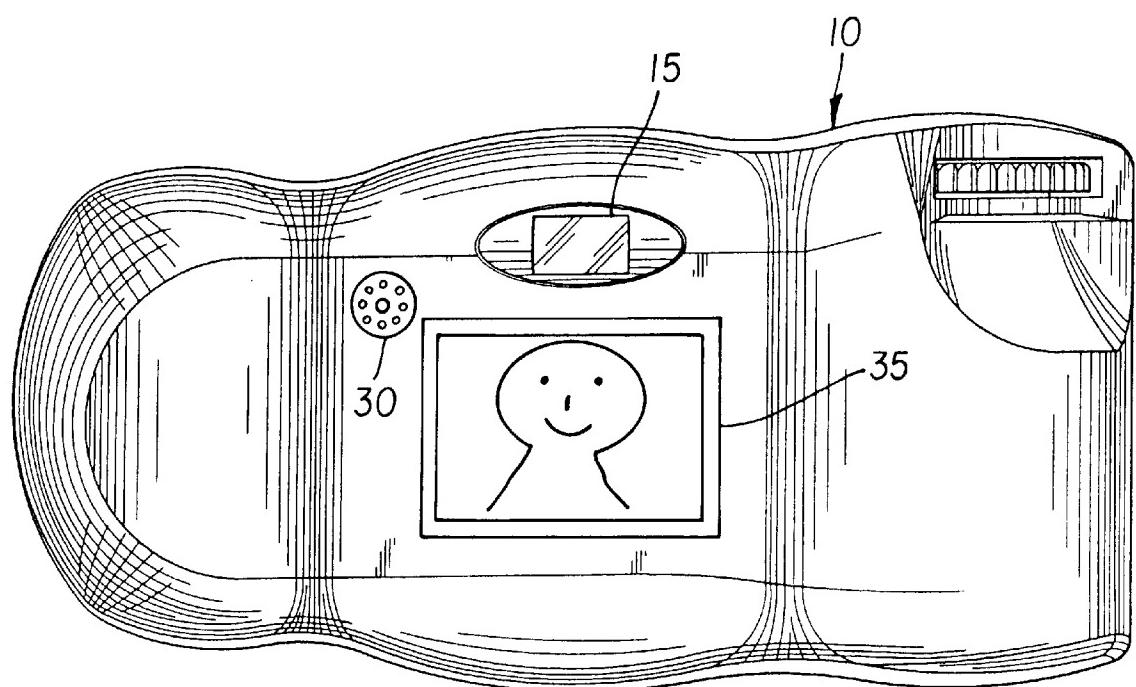


FIG. 2a

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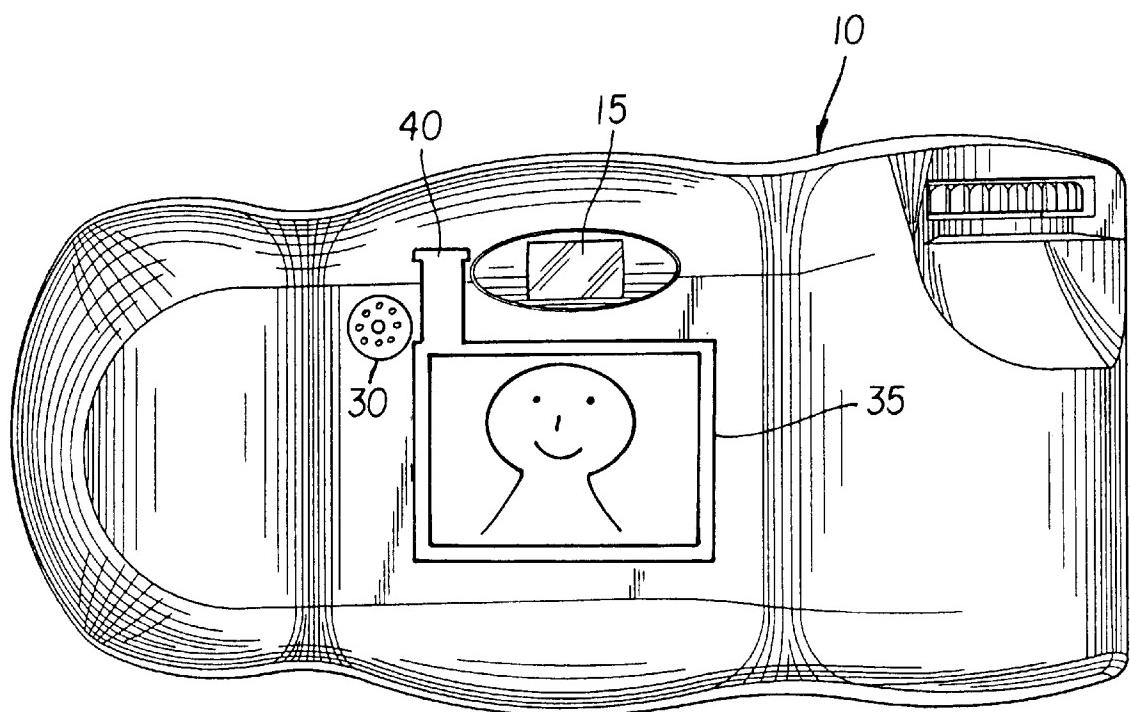


FIG. 2b

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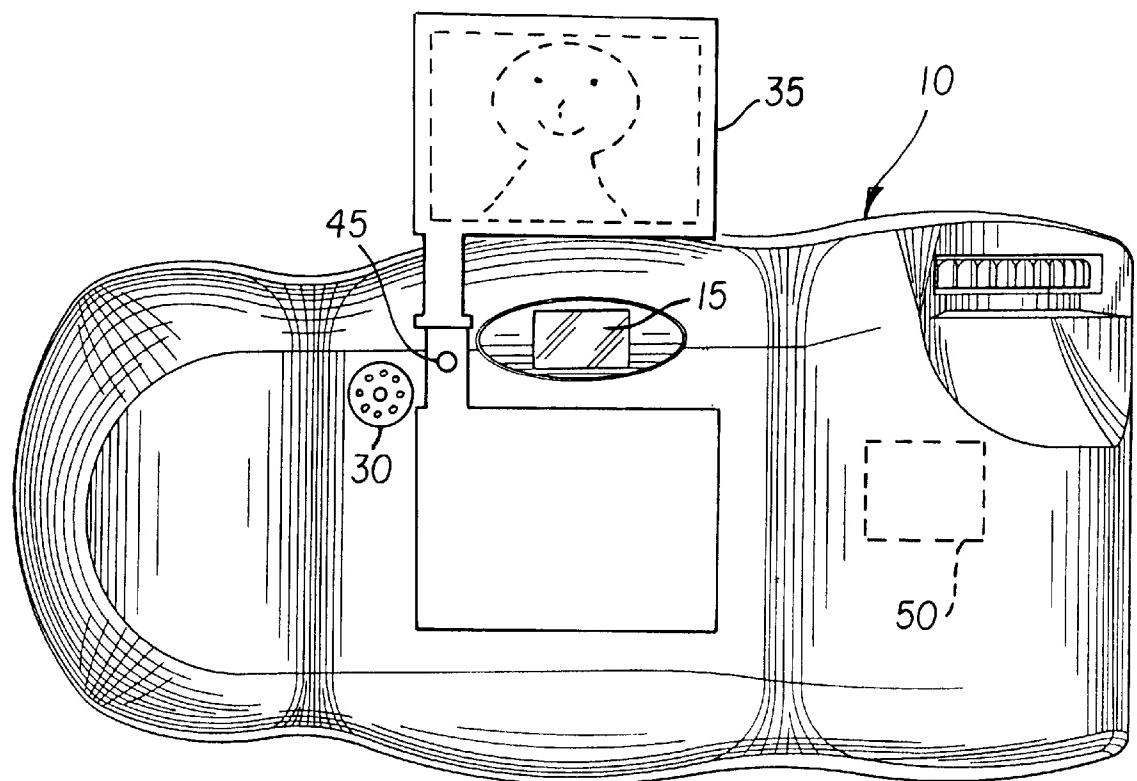


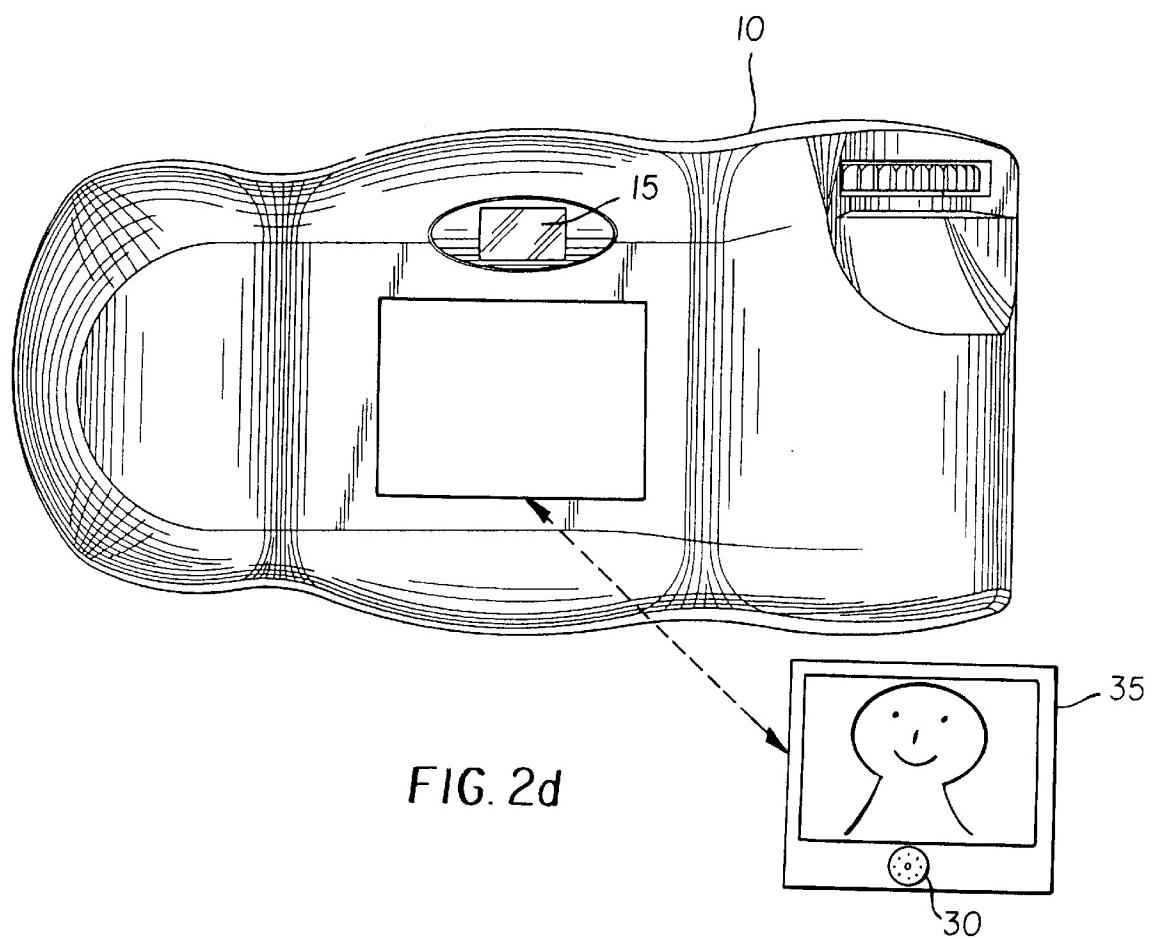
FIG. 2c

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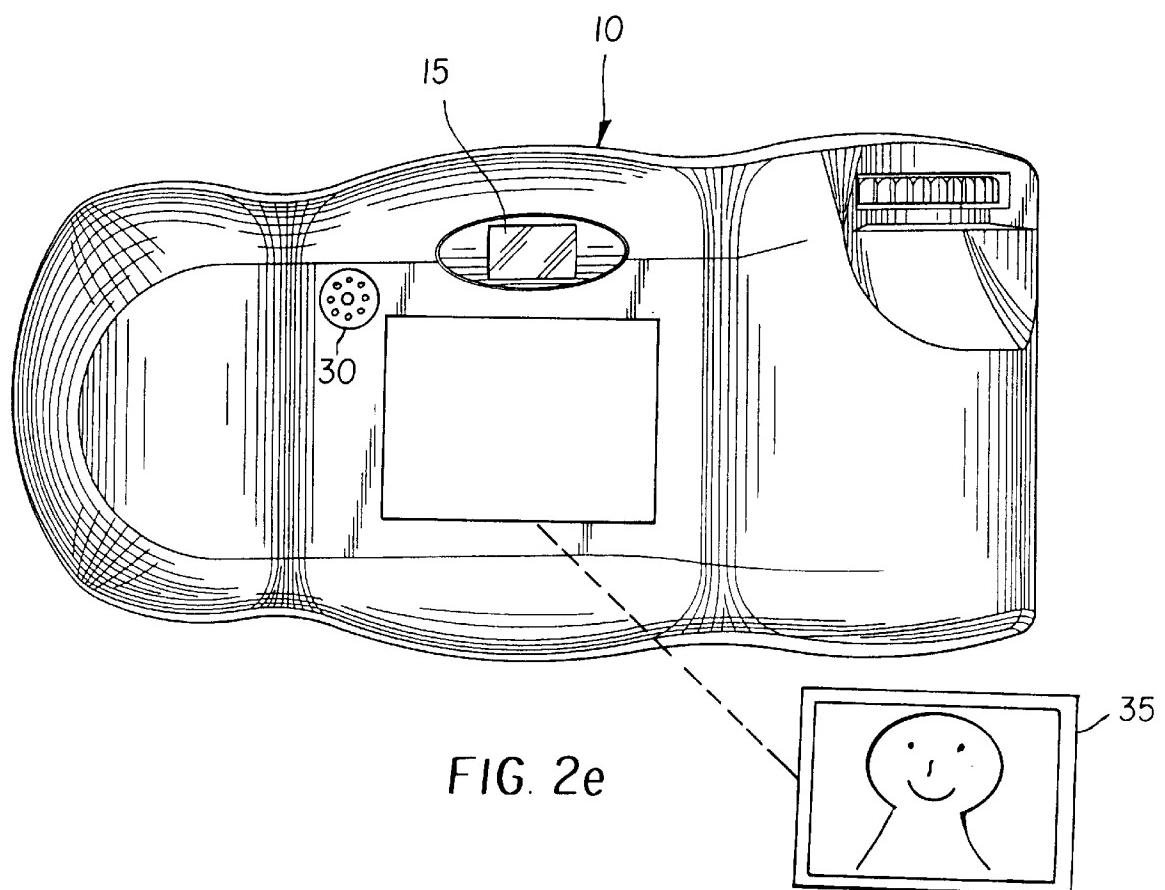


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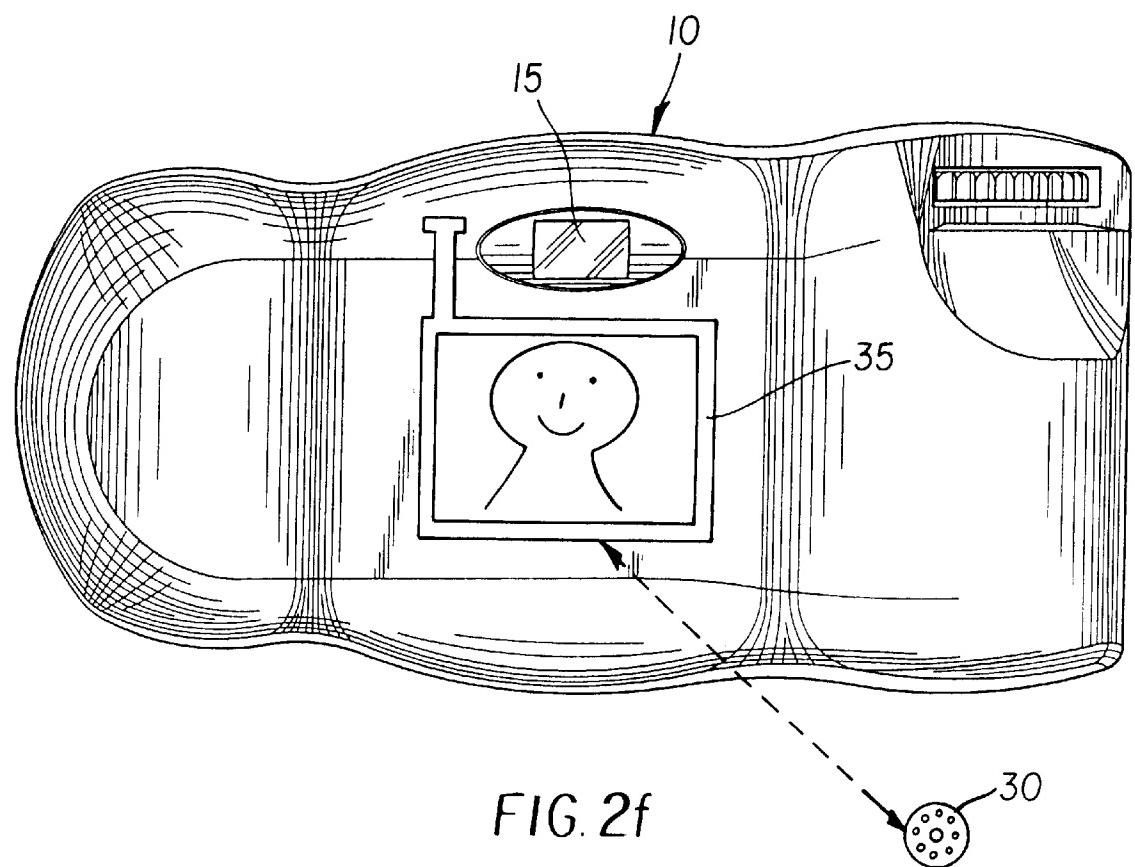


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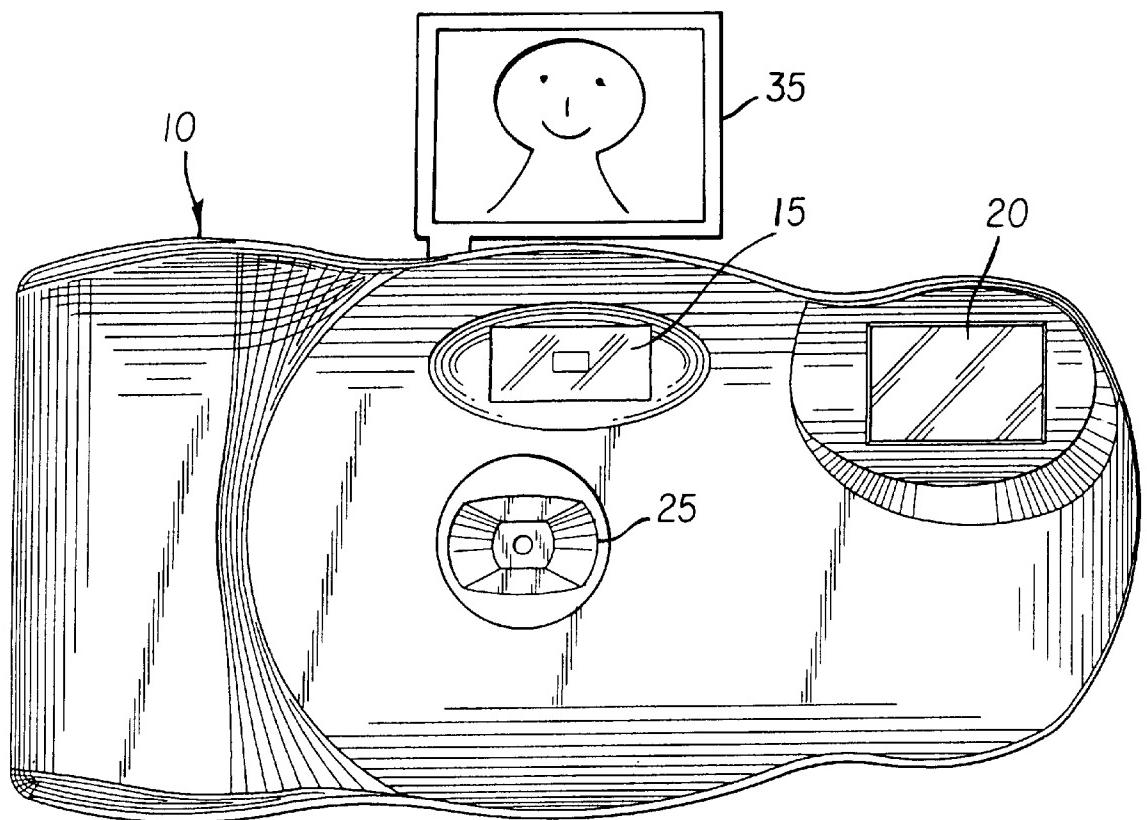


FIG. 3

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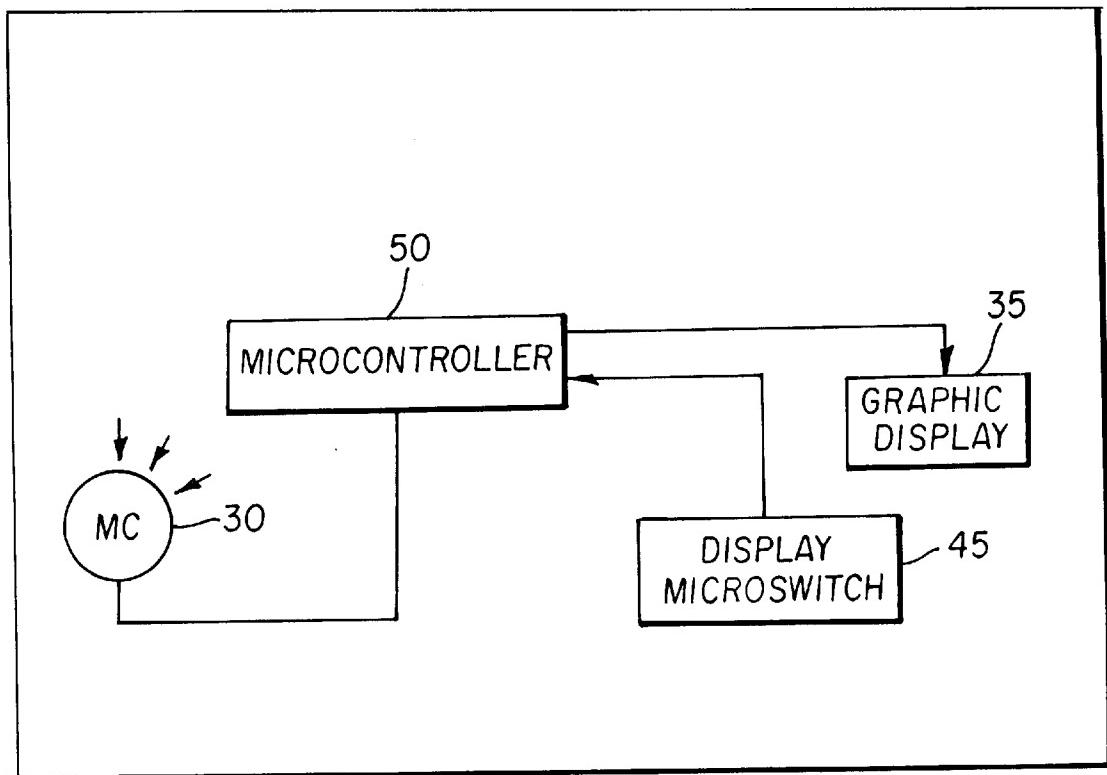


FIG. 4

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**SPEECH RECOGNITION CAMERA
UTILIZING A FLIPPABLE GRAPHICS
DISPLAY**

FIELD OF THE INVENTION

This invention relates generally to the field of cameras and, more specifically, to cameras having speech recognition capabilities and a flippable display for viewing the results of certain speech commands.

BACKGROUND OF THE INVENTION

When a camera with speech recognition capabilities is used by a consumer, the camera responds to user inquiries and operating commands by virtue of the spoken word. This capability is known in prior art such as U.S. Pat. No. 4,951,079 by Hoshino et. al. This type of camera, although allowing for remote operation, does not permit proper verification of certain spoken words. For example, if the camera zoom function is executed remotely through a voice command, the camera will respond, however, the user has no way of verifying the composition of the image being captured by the camera. The above-cited U.S. Pat. No. 4,951,079 discloses a visible display that displays symbols illustrating the function that is performed in response to the commands, such as a "1" for zoom and the like.

Although the presently known and utilized camera with voice recognition is satisfactory, it is not without drawbacks. The prior art cameras do not actually display the physical results of the camera operations performed in response to the commands so as to permit user verification of the commands.

SUMMARY OF THE INVENTION

The present invention uses a graphical display to illustrate the results of remotely issued voice recognition commands, such as zoom in, zoom out, flash on, flash off, focus commands, and other related camera commands which are directly related to the image content of the picture to be captured. For example, a command such as flash on would visibly indicate a brighter image in the display, and a command of flash off would show a correspondingly darker image in the display. Thus, the camera user views in real time the consequences of issuing these commands. In addition, the flippable graphic display permits the verification of results of the voice commands from the front of the camera. Thus, the user can be included in the picture while controlling image composition, and upon liking the results, can then command the camera to take the picture.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of a body for a voice recognition camera according to the present invention;

FIG. 2a is a rear view of a voice recognition camera according to the present invention, including a view of the graphic display;

FIG. 2b is an alternate rear view of the voice recognition camera showing the graphical display with a hinge for flipping the display;

FIG. 2c is an additional rear view of FIG. 2b showing the graphical display deployed above the camera body, with the display contents dashed to indicate viewing an automatically rotated image from the front of the camera;

FIG. 2d is another alternative rear view of the voice recognition camera showing the graphic display remotely located from the main camera body;

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FIG. 2e is another rear view of the voice recognition camera showing the graphic display removed as a module from the main camera body as in FIG. 2d; however, a microphone is attached to the main camera body;

FIG. 2f is another rear view of the voice recognition camera showing the microphone removed from the main camera body as in FIG. 2d; however, the graphical display is on the main camera body.

FIG. 3 shows a front view of the voice recognition camera with the graphic display deployed above the camera; and

FIG. 4 is a block diagram of the voice recognition camera showing a microphone, microcontroller, and graphical display.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a front view showing a camera body 10 for a voice recognition camera with a viewfinder 15, a flash 20, and a zoom lens 25 for zooming in and out on scenes.

FIG. 2a is a rear view of the voice recognition camera of the present invention showing the camera microphone 30, and a graphic display 35. In addition, this view shows the graphical display 35 displaying scenes viewed through the lens 25 on a real-time basis. In normal use, the user will issue a voice command through the microphone 30, and will see the physical results of the camera operation of the command within the graphic display 35. For instance, if the user chooses a command such as zoom in, the user will see the image enlarged in size within the graphic display 35. In another instance, if the user chooses a command such as flash on, the user will see the image visually brighten within the graphic display 35.

FIG. 2b is an alternative rear view of the preferred embodiment of the voice recognition camera of the present invention showing the graphical display 35 moveable upon the camera body 10 by virtue of a hinge 40. The hinge 40 permits the graphical display 35 to be moved to a position above the camera body 10. This permits a user in front of the camera to view the contents of the graphical display 35.

FIG. 2c is an additional rear view of FIG. 2b illustrating the graphical display 35 deployed above the camera body 10; this is obviously accomplished by manually moving the graphical display 35 upwardly above the camera body 10. A display microswitch 45 is activated upon movement of the display 35 above the camera body 10 for indicating to the microcontroller 50 the orientation of the display 35, the orientation shown in FIG. 2c. The microcontroller 50 will electronically rotate the image in the display 35 one hundred eighty degrees for permitting the user to view the image as seen through the viewfinder 25. In this instance, a user in front of the camera will view an image in the graphic display 35 in the same orientation as a user at the rear of the camera would see while looking through the viewfinder 15.

FIG. 2d is also an alternative embodiment of a rear view of the voice recognition camera of the present invention. In this embodiment, the microphone 30 is attached to the graphical display 35 which is, in turn, physically detachable from the main camera body 10. The graphical display 35 communicates with the microcontroller 50 via a wired or wireless communication link, as illustrated by the dashed line. The wireless communication link may be accomplished by any means well known in the art and will not, therefore, be discussed in detail herein.

FIG. 2e is another alternative rear view of the voice recognition camera of the present invention. In this

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embodiment, the microphone **30** is shown attached to the camera body **10**. The graphical display **35** is detached and disposed apart from the main camera body **10**, as shown by the dashed line indicating a wired or wireless link between the camera body **10** and graphic display **35**.
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FIG. 2f is still another alternative embodiment of a rear view of the voice recognition camera of the present invention. The graphic display **35** is shown disposed on the camera body **10**, and a remote microphone **30** is physically separated from the camera body **10**, as illustrated by the dashed line, indicating a wired or wireless link between the camera body **10** and remote microphone **30**.
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FIG. 3 is a front view of the preferred embodiment of the voice recognition camera of the present invention. The graphic display **35** is shown attached to the camera body and positioned above the camera body **10**. The graphical display **35** displays the image in an orientation as a user at the rear of the camera would see while looking through the viewfinder **15**.
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FIG. 4 is a block diagram of the voice recognition camera of the present invention. The user inputs voice commands through the microphone **30** and the microcontroller **50**, such as a Sensory RSC-164 chip, recognizes the voice command and operates the intended function. Such voice recognition can be that as in U.S. Pat. No. 4,951,079. In the preferred embodiment, the microswitch **45** sends a signal to the microprocessor **50** for indicating the current state of the microswitch **45**. If the microcontroller **50** determines that the microswitch **45** is activated, the image would be automatically rotated one hundred eighty degrees by the microcontroller **50**, and then sent to the graphical display **35**. If the microcontroller **50** determines that the microswitch **45** is not activated, the image would be sent to the graphical display **35** as normal.
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In the alternate embodiments, the camera microcontroller **50** will operate the remote interface, such as a wire serial link or wireless infrared link, between the camera and graphic display **35** and/or microphone **30**. In this situation the image would be sent to the graphic display as normal.
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Although the present invention has been fully described with reference to the preferred embodiments thereof, many modifications and variations thereof will be apparent to those skilled in the art without departing from the spirit and scope thereof.
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PARTS LIST

10 camera body

15 viewfinder

20 flash

25 zoom capable taking lens

30 microphone

35 graphic display

40 hinge

45 microswitch

50 microcontroller

What is claimed is:

1. A camera for recognizing voice commands, and for visually displaying an image to be captured by the camera with camera operations performed thereon as instructed by the voice commands, the camera comprising:
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- (a) a camera body;
- (b) a microphone disposed on said camera body for inputting voice commands;
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- (c) a controller disposed in said camera body for receiving and recognizing voice commands that change the com-

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position of the image, and for implementing results of the voice command; and

(d) a movable display attached to said camera body for visually displaying the image to-be-captured by the camera with the camera operations performed thereon as instructed by the voice commands, said display being movable on the camera body to a position that permits a user in front of the camera to view the contents of the display in the same orientation as would be viewed at the rear of the camera while looking through a viewfinder.
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2. The camera as in claim 1 further comprising a sensor for sensing positions of said display.

3. A camera for recognizing voice commands, and for visually displaying an image to-be-captured by the camera with camera operations performed thereon as instructed by the voice commands, the camera comprising:
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- (a) a camera body;
- (b) a controller disposed in said camera body for receiving and recognizing voice commands that change the composition of the image, and for implementing results of the voice commands;
- (c) a remote microphone that communicates with said controller for inputting voice commands; and
- (d) a movable display attached to said camera body for visually displaying an image to-be-captured by the camera with camera operations performed thereon as instructed by the voice commands, said display being movable on the camera body to a position that permits a user in front of the camera to view the contents of the display in the same orientation as would be viewed at the rear of the camera while looking through a viewfinder.
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4. The camera as in claim 3 further comprising a sensor for sensing positions of said display.

5. A camera for recognizing voice commands, and for visually displaying an image to-be-captured by the camera with camera operations performed thereon as instructed by the voice commands, the camera comprising:
35

- (a) a camera body;
- (b) a controller disposed in said camera body for receiving and recognizing voice commands that change the composition of the image, and for implementing results of the voice commands;
- (c) a remote microphone that communicates with said controller for inputting voice commands; and
- (d) a remote display that communicates with said controller for visually displaying the image to-be-captured by the camera with camera operations performed thereon as instructed by the voice commands.
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6. The camera as in claim 5, wherein said display is detachable from the camera body.

7. The camera as in claim 6, wherein said display displays the image to-be-captured in an orientation as would be viewed at the rear of the camera while looking through a viewfinder.
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8. The camera as in claim 6 wherein said remote microphone is included with said display.

9. A camera for recognizing voice commands, and for visually displaying an image to-be-captured by the camera with camera operations performed thereon as instructed by the voice commands, the camera comprising:
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- (a) a camera body;
- (b) a controller disposed in said camera body for receiving and recognizing voice commands that change the com-

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- position of the image, and for implementing results of
the voice commands;
(c) a microphone disposed on said camera body for
inputting voice commands; and
(d) a remote display detachable from the camera body that
communicates with said controller for visually displaying
the image to-be-captured by the camera with cam-

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era operations performed thereon as instructed by the
voice commands.

10. The camera as in claim 9, wherein said display
displays the image to-be-captured in an orientation as would
be viewed at the rear of the camera while looking through a
viewfinder.

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